

## ABSTRACT

A catalytic combustor (14) includes a first catalytic stage (30), a second catalytic stage (40), and an oxidation completion stage (49). The first catalytic stage receives an oxidizer (e.g., 20) and a fuel (26) and discharges a partially oxidized fuel/oxidizer mixture (36). The second catalytic stage receives the partially oxidized fuel/oxidizer mixture and further oxidizes the mixture. The second catalytic stage may include a passageway (47) for conducting a bypass portion (46) of the mixture past a catalyst (e.g., 41) disposed therein. The second catalytic stage may have an outlet temperature elevated sufficiently to complete oxidation of the mixture without using a separate ignition source. The oxidation completion stage is disposed downstream of the second catalytic stage and may recombine the bypass portion with a catalyst exposed portion (48) of the mixture and complete oxidation of the mixture. The second catalytic stage may also include a reticulated foam support (50), a honeycomb support, a tube support or a plate support.